

Amendments to the Claims:

Following is a complete listing of the claims pending in the application, as amended:

1. (Cancelled)
2. (Previously presented) The method of claim 5 wherein:
removing material from a microelectronic workpiece comprises providing a first plate and a first planarizing pad on the first plate, the first pad having a surface defining the first planarizing surface; and
removing additional material from the workpiece comprises providing a second plate and a second planarizing pad on the second plate, the second pad having a surface defining the second planarizing surface, and the first and second pads being composed of the same material.
3. (Previously presented) The method of claim 5 wherein:
removing material from a microelectronic workpiece comprises providing a first planarizing pad having a surface defining the first planarizing surface and conditioning the first planarizing surface to have the first roughness, wherein the first and second pads are composed of the same material; and
removing additional material from the workpiece comprises providing a second planarizing pad having a surface defining the second planarizing surface and conditioning the second surface to have the second roughness.
4. (Previously presented) The method of claim 5 wherein:
pressing the workpiece against the first planarizing surface comprises pressing the workpiece against a planarizing surface of a first pad on a first plate; and

pressing the workpiece against the second planarizing surface comprises moving the workpiece away from the first pad and then pressing the workpiece against a planarizing surface of a second pad on a second plate.

5. (Previously presented) A method for planarizing a microelectronic workpiece, comprising:

removing material from a microelectronic workpiece during a first abrasive stage of a planarizing cycle by pressing the workpiece against a first planarizing surface having a first roughness and an abrasive slurry on the first planarizing surface, wherein the first planarizing surface is on a first type of planarizing media;

terminating the first abrasive stage when a cover layer on a face of the workpiece is at least substantially planar at an elevation in an overburden portion of the cover layer;

removing additional material from the workpiece during a second abrasive stage of the planarizing cycle by pressing the workpiece against a second planarizing surface having a second roughness and an abrasive slurry on the second planarizing surface, wherein the second planarizing surface is on the first type of planarizing media, and wherein the first roughness is greater than the second roughness, the second abrasive stage commencing after terminating the first abrasive stage; and

terminating the second abrasive stage at a desired endpoint.

6. (Previously presented) The method of claim 5 wherein:

removing material from a microelectronic workpiece further comprises monitoring a drag force between the workpiece and the first planarizing surface and terminating the first abrasive stage when the drag force indicates that a cover layer on a face of the workpiece is at least substantially planar at an elevation in an overburden portion of the cover layer; and

removing additional material from the workpiece comprises commencing the second abrasive stage after terminating the first abrasive stage,

monitoring a drag force between the workpiece and the second planarizing surface, and terminating the second abrasive stage when the drag force indicates that the workpiece is at a desired endpoint.

7. (Previously presented) The method of claim 5 wherein:
removing material from a microelectronic workpiece further comprises monitoring a drag force between the workpiece and the first planarizing surface; and terminating the first abrasive stage comprises terminating the first stage when the drag force indicates that a cover layer on a face of the workpiece is at least substantially planar at an elevation in an overburden portion of the cover layer.
8. (Previously presented) The method of claim 5, further comprising:
sensing a surface condition of the first planarizing surface; and conditioning at least a portion of the first planarizing surface to have the first roughness according to the sensed surface condition of the first planarizing surface.
9. (Previously presented) The method of claim 5, further comprising:
sensing a surface condition of the first and second planarizing surfaces; conditioning at least a portion of the first planarizing surface to have the first roughness according to the sensed condition of the first planarizing surface; and conditioning at least a portion of the second planarizing surface to have the second roughness according to the sensed condition of the second planarizing surface.
10. (Previously presented) The method of claim 5, further comprising:
providing a single planarizing pad;

conditioning the single planarizing pad to have a planarizing surface with the first roughness to define the first planarizing surface for the first abrasive stage; and
reconditioning the planarizing surface of the single pad to have the second roughness to define the second planarizing surface for the second abrasive stage.

11-28. (Canceled)

29. (Previously presented) The method of claim 32 wherein:
removing material from a microelectronic workpiece comprises providing a first plate and a first planarizing pad on the first plate, the first pad having a surface defining the first planarizing surface; and
removing additional material from the workpiece comprises providing a second plate and a second planarizing pad on the second plate, the second pad having a surface defining the second planarizing surface.

30. (Previously presented) The method of claim 32 wherein:
removing material from a microelectronic workpiece comprises providing a first planarizing pad having a surface defining the first planarizing surface and conditioning the first planarizing surface to have the first roughness; and
removing additional material from the workpiece comprises providing a second planarizing pad having a surface defining the second planarizing surface and conditioning the second surface to have the second roughness.

31. (Previously presented) The method of claim 32 wherein:
pressing the workpiece against the first planarizing surface comprises pressing the workpiece against a planarizing surface of a first pad on a first plate;
and

pressing the workpiece against the second planarizing surface comprises moving the workpiece away from the first pad and then pressing the workpiece against a planarizing surface of a second pad on a second plate.

32. (Previously presented) A method of planarizing a microelectronic workpiece, comprising:

removing a first portion of a cover layer of material on a microelectronic workpiece during a first abrasive stage of a planarizing cycle by pressing the workpiece against a first planarizing surface having a first roughness and an abrasive slurry on the first planarizing surface, wherein an overburden portion of the cover layer of material is left remaining on the workpiece at the end of the first stage;

terminating the first abrasive stage when the cover layer is at least substantially planar at an elevation in the overburden portion of the cover layer;

removing the overburden portion of material from the cover layer on the workpiece during a second abrasive stage of the planarizing cycle by pressing the workpiece against a second planarizing surface having a second roughness and an abrasive slurry on the second planarizing surface, wherein the first roughness is greater than the second roughness, the second abrasive stage commencing after terminating the first abrasive stage; and

terminating the second abrasive stage at a desired endpoint.

33. (Previously presented) The method of claim 32 wherein:

removing material from a microelectronic workpiece further comprises monitoring a drag force between the workpiece and the first planarizing surface and terminating the first abrasive stage when the drag force indicates that the cover layer is at least substantially planar at an elevation in the overburden portion of the cover layer; and

removing additional material from the workpiece comprises commencing the second abrasive stage after terminating the first abrasive stage,

monitoring a drag force between the workpiece and the second planarizing surface, and terminating the second abrasive stage when the drag force indicates that the workpiece is at a desired endpoint.

34. (Previously presented) The method of claim 32 wherein removing material from a microelectronic workpiece further comprises:

monitoring a drag force between the workpiece and the first planarizing surface;
and

terminating the first abrasive stage when the drag force indicates that the cover layer is at least substantially planar at an elevation in the overburden portion of the cover layer.

35. (Previously presented) The method of claim 32, further comprising:
sensing a surface condition of the first planarizing surface; and
conditioning at least a portion of the first planarizing surface to have the first roughness according to the sensed surface condition of the first planarizing surface.

36. (Previously presented) The method of claim 32, further comprising:
sensing a surface condition of the first and second planarizing surfaces;
conditioning at least a portion of the first planarizing surface to have the first roughness according to the sensed condition of the first planarizing surface; and
conditioning at least a portion of the second planarizing surface to have the second roughness according to the sensed condition of the second planarizing surface.

37. (Currently amended) A method of planarizing a microelectronic workpiece, comprising:

removing material from a microelectronic workpiece during a first abrasive stage of a planarizing cycle by pressing the workpiece against a first planarizing

surface having a first roughness and an abrasive slurry on the first planarizing surface;
terminating the first abrasive stage of the planarizing cycle when a cover layer on a face of the workpiece is at least substantially planar at an elevation in an overburden portion of the cover layer;
removing additional material from the workpiece during a second abrasive stage of the planarizing cycle by pressing the workpiece against a second planarizing surface having a second roughness and an abrasive slurry on the second planarizing surface, wherein the first roughness is greater than the second roughness; ~~and~~
commencing the second abrasive stage after terminating the first abrasive stage; and
terminating the second abrasive stage of the planarizing cycle at a desired endpoint.

38. (Original) The method of claim 37 wherein:

removing material from a microelectronic workpiece comprises providing a first plate and a first planarizing pad on the first plate, the first pad having a surface defining the first planarizing surface; and
removing additional material from the workpiece comprises providing a second plate and a second planarizing pad on the second plate, the second pad having a surface defining the second planarizing surface.

39. (Original) The method of claim 37 wherein:

removing material from a microelectronic workpiece comprises providing a first planarizing pad having a surface defining the first planarizing surface and conditioning the first planarizing surface to have the first roughness; and
removing additional material from the workpiece comprises providing a second planarizing pad having a surface defining the second planarizing surface and conditioning the second surface to have the second roughness.

40. (Original) The method of claim 39, further comprising pressing the workpiece against a finishing pad coated with a non-abrasive solution after the second abrasive stage, wherein the finishing pad is separate from the first and second pads.

41. (Canceled)

42. (Original) The method of claim 37, further comprising:
sensing a surface condition of the first planarizing surface; and
conditioning at least a portion of the first planarizing surface to have the first roughness by adjusting a downforce of a conditioning end-effector according to the sensed surface condition of the first planarizing surface.

43. (Original) The method of claim 37, further comprising:
sensing a surface condition of the first and second planarizing surfaces;
conditioning at least a portion of the first planarizing surface to have the first roughness according to the sensed condition of the first planarizing surface; and
conditioning at least a portion of the second planarizing surface to have the second roughness according to the sensed condition of the second planarizing surface.

44. (Cancelled)

45. (Previously presented) A method of planarizing a microelectronic workpiece, comprising:
removing material from a microelectronic workpiece during a first abrasive stage of a planarizing cycle by pressing the workpiece against a first planarizing pad having a first roughness and an abrasive slurry on the first planarizing surface;

determining when the microelectronic workpiece is at least approximately planar, wherein determining planarity comprises monitoring a drag force between the workpiece and the first planarizing pad;
terminating the first abrasive stage when the drag force indicates that a cover layer on a face of the workpiece is at least substantially planar at an elevation in an overburden portion of the cover layer; and
removing additional material from the workpiece during a second abrasive stage of the planarizing cycle by pressing the workpiece against a second planarizing pad having a second roughness and an abrasive slurry on the second planarizing surface, wherein the first roughness is greater than the second roughness.

46. (Previously presented) The method of claim 45, further comprising:
sensing a surface condition of the first planarizing pad; and
conditioning at least a portion of the first planarizing pad to have the first roughness according to the sensed surface condition of the first planarizing pad.

47. (Previously presented) The method of claim 45, further comprising:
sensing a surface condition of the first and second planarizing pad;
conditioning at least a portion of the first planarizing pad to have the first roughness according to the sensed condition of the first planarizing pad;
and
conditioning at least a portion of the second planarizing pad to have the second roughness according to the sensed condition of the second planarizing pad.

48. (Original) A method of planarizing a microelectronic workpiece, comprising:

reducing topographical variances across a surface of a microelectronic workpiece during a first abrasive stage of a planarizing cycle by abrading the workpiece against a surface having a first roughness;
terminating the first abrasive stage of the planarizing cycle at an overburden level in a layer of material on the workpiece before the desired endpoint; and
removing additional material from a planar surface on the workpiece during a second abrasive stage of the planarizing cycle by abrading the workpiece against a second planarizing surface having a second roughness less than the first roughness.

49-61. (Canceled)